

## REMARKS

In response to the Office Action of April 19, 2007, claims 1 and 2 are amended and new claims 10-15 are added. Claims 1 and 2 were rejected under 35 U.S.C. § 102(b) and claims 1-9 were rejected under 35 U.S.C. § 103(a). Each of these rejections is addressed below.

### Rejections under 35 U.S.C. § 102(b)

The Court of Appeals for the Federal Circuit has stated that anticipation requires the presence in a single prior art reference of each and every element of the claimed invention. *Lindemann Maschinenfabrik GMBH v. American Hoist & Derrick Co.*, 730 F.2d 1452, 1458 (Fed. Cir. 1984); *Alco Standard Corp. v. Tennessee Valley Auth.*, 1 USPQ2d 1337, 1341 (Fed. Cir. 1986). "There must be no difference between the claimed invention and the reference disclosure, as viewed by a person of ordinary skill in the field of the invention." *Scripps Clinic v. Genentech Inc.*, 18 USPQ2d 1001, 1010 (Fed. Cir. 1991, citations omitted).

The Examiner has rejected claims 1 and 2 under 35 U.S.C. § 102(b) as being anticipated by HCAPLUS abstract 2000:843249. The Examiner reasons that this reference discloses a plant growth stimulating insecticide composition that comprises 1-50% ethephon, 0.5-10% imidacloprid and 10-40% sulfuric or hydrochloric acid (HCl) and dispersant/solubilizer. The Examiner reasons that although the reference does not specifically state that the efficiency and efficacy of ethephon is increased by adding HCl, inasmuch as the reference teaches applying a mixture of HCl and ethephon to the same crops, the same effect would necessarily be obtained. From this the Examiner concludes that the claims are anticipated by this reference.

In response to this rejection, independent claims 1 and 2 have been amended to clarify that the claimed composition comprises (a) an acid and (b) one or more phosphonic compounds, wherein said phosphonic compound(s) is co-formulated with said acid for direct application to the vegetation of interest. Support for this amendment to the claims can be found in the Specification (page 1, **Summary of the Invention**, lines 1-5). Additionally, new claims 10 and 11 directed to a pH range of 1-3 have been added. Applicant maintains that there is ample support in the Specification for this range in pH (page 2, lines 3-4 and lines 12-13). Finally, new

claims 12-15 have been added to more thoroughly define the invention. Claims 12 to 15 are drawn to a specific embodiment of the invention in which the acid is phosphoric acid (12 and 14) and the phosphonic compound is ethephon (13 and 15).

As noted by the Examiner the HCAPLUS reference does in fact teach a composition comprised of ethephon and hydrochloric acid. However, there is no teaching or suggestion in this reference that this composition is co-formulated with HCl prior to spraying for direct application to the vegetation of interest. In fact, it cannot even be discerned from this reference when the HCl is actually added to the formulation. As such, Applicant maintains that claims 1 and 2, as amended, are not anticipated by the prior art relied upon by the Examiner and respectfully requests that this rejection be withdrawn. New claims 12-15 are drawn to a specific embodiment of the invention wherein the acid is phosphoric acid. As such, Applicant maintains that new claims 12 to 15 are not anticipated by the reference relied upon by the Examiner as this reference teaches only hydrochloric and sulfuric acids and not phosphoric acid.

Rejection under 35 U.S.C. § 103(a)

The Examiner bears the burden of establishing a *prima facie* case of obviousness under 35 U.S.C. § 103. In determining obviousness, one must focus on Applicant's invention as a whole. *Symbol Technologies Inc. v. Opticon Inc.*, 19 USPQ2d 1241,1246 (Fed. Cir. 1991). The primary inquiry is:

whether the prior art would have suggested to one of ordinary skill in the art that this process should be carried out and would have had a reasonable likelihood of success . . . Both the suggestion and the expectation of success must be found in the prior art, not in the applicant's disclosure.

*In re Dow Chemical*, 5 USPQ2d 1529, 1531 (Fed. Cir. 1988). To establish obviousness, both the elements of the claimed invention plus the motivation to combine the elements must be present in the prior art. *Ex parte Hiyamizu*, 10 USPQ2d 1393, 1394 (PTO Bd. App. Intf., 1988).

The Examiner has rejected claims 1-9 under 35 U.S.C. § 103(a) as being unpatentable over Fritz *et al.* (U.S. Pat. No. 3,879,188) in view of CABA abstract 80:49077, The Agrochemicals Handbook (1983) pages A179-A180 and The Farm Chemicals Handbook (1998)

page 164. The Examiner provides that Fritz *et al.* disclose the various properties of ethephon and other phosphonic acid compounds as plant growth regulators, as well as, the desirability of keeping the pH of these compounds below 5. The CABA abstract is cited as teaching a foliar spray of ethephon and The Agrochemicals Handbook and the Farm Chemicals Handbook '98 are cited as teaching that ethephon is a plant growth regulator that is stable in aqueous solutions having a pH of less than 3.5. The Examiner reasons that although Fritz *et al.* do not expressly disclose the combination of phosphonic acid plant growth regulators and an acid, such as HCl or  $H_3PO_4$ , it is well known that ethephon decomposes at a pH of greater than 3.5 and Fritz *et al.* do disclose the desirability of keeping the pH of ethephon and other phosphonic plant growth regulators below 5. From this, the Examiner concludes that the ordinary skilled artisan would thus have been motivated to formulate ethephon with acid in order to keep the pH at the highly acidic range below 3.5 and further that selection of any of the acids of the instant claims would have been obvious because these acids are common acidifying agents. As noted above, claims 1 and 2 have been amended to clarify that the claimed compositions of the instant invention are co-formulations comprised of the phosphonic acid compound or compounds with an acid for direct application. As detailed below, Applicant maintains that the claims, as amended, are not rendered obvious by the combination of references relied upon by the Examiner.

The instant invention as set forth in claims 1 and 2, as amended, and new claims 12-15 is drawn to an agricultural composition comprised of a combination of a specific acid with one or more phosphonic compounds, wherein said phosphonic compound(s) is co-formulated with said acid for direct application to the vegetation of interest. The composition is comprised of a mineral acid selected from the group consisting of hydrochloric acid, nitric acid, phosphoric acid, phosphorus acid, poly phosphoric acid, and perchloric acid and one or more phosphonic acids, selected from (2-chloroethyl)phosphonic acid and salts thereof.

A key inventive concept is the discovery that mineral acids, other than sulfuric acid, can increase the efficiency and efficacy of phosphonic acid compounds and that the phosphonic acid compounds can be reliably co-formulated with said mineral acids to provide a product that can be directly applied to the vegetation of interest. As provided in the instant Specification: "[t]he

present invention addresses [the need for increasing defoliation and/or growth inhibition efficacy of phosphonic acid analogs] by providing a composition formed by mixing ethephon and an acid in the same formulated agri-chemical product." (Specification, page 1, **Summary of the Invention**, lines 1-4, emphasis added). As noted by Volgas *et al.*, U.S. Patent Pub. No. 2007/0037707, filed August 11, 2006, which is cited by the Examiner as showing the current state of the art, there are a number of advantages to formulating pesticides with the acid adjuvant built in (Volgas *et al.*, paragraph 8). Among the advantages listed are convenience to the grower and consistency of the applied formulations. As noted by the author "[g]rowers typically do not like to add separate ingredients to enhance pesticide efficacy" and "[b]y adding the adjuvant directly into the pesticide formulation, formulators can lock in the application rate of both the pesticide and adjuvant." (Volgas *et al.* paragraph 8).

As noted by the Examiner, there is no question that it is well-known in the art that aqueous ethephon formulations are unstable at pH levels above 3.5. This is not to say, however, that it is well known that this agricultural chemical can be reliably co-formulated with an acid adjuvant for direct application to the crop of interest. In fact, just the opposite is true. As noted by Volgas *et al.*, U.S. Patent Pub. No. 2007/0037707:

Acidic adjuvants have commonly been used as pH modifiers or buffers for agricultural pesticide applications. . . .

These acids are used to modify the pH of spray solutions and are added separately to the spray solution by the applicator. Reduced pH can improve uptake of herbicides. . . . Acids have also been used to prevent alkaline hydrolysis of some pesticides. . . .

One such acidic adjuvant that has been applied with positive effect with (2-chloroethyl) phosphonic acid is called LI-700. LI-700 contains predominantly propionic acid and surfactants. LI-700 has been sold as an adjuvant or additive, and can not be reliably co-formulated with (2-chloroethyl)phosphonic acid.

Another such adjuvant that has been applied with positive effect with (2-chloroethyl) phosphonic acid contains both citric and phosphoric acid. This adjuvant has only been sold as a tank mix additive for (2-chloroethyl) phosphonic acid.

(Volgas *et al.* paragraphs 4-7). Thus, the Volgas *et al.* application, which was filed three years after the instant application and which was cited by the Examiner as evidencing the current state

of the art, highlights the fact that there remains a need for agricultural compositions in which the acid adjuvant is "built in" or co-formulated with the active ingredient. The instant application provides such a composition. Applicant maintains that none of the references relied upon by the Examiner, taken either alone or combined, teach or suggest such a co-formulation. As such, Applicant maintains that the instant application is not rendered obvious by this combination of references and respectfully requests that the Examiner reconsider this rejection.

The Examiner has rejected claims 1-9 under 35 U.S.C. § 103(a) as being unpatentable over Fritz *et al.* (U.S. Pat. No. 3,879,188) in view of CABA abstract 80:49077 and The Agrochemicals Handbook (1983) pages A179-A180 as discussed above and further in view of HCAPLUS abstract 2000:843249. The Examiner reasons that the difference between the claimed invention and Fritz *et al.* is that Fritz *et al.* do not expressly disclose the combination of ethephon or other phosphonic acid plant growth regulators and HCl. The Examiner further reasons however that it is well known that ethephon decomposes at a pH of greater than 3.5 and further that Fritz *et al.* recognize the desirability of keeping the pH of ethephon and other phosphonic plant growth regulators below 5. From this, the Examiner concludes that the ordinary skilled artisan would have been motivated to formulate ethephon with acid in order to keep the pH below 3.5 and that selection of an acid such as HCl would have been obvious because HCl is a common acidifying agent, which has been shown to be suitable in combination with ethephon (HCAPLUS abstract).

As noted above, claims 1 and 2 have been amended to clarify that the claimed compositions of the instant invention are comprised of one or more phosphonic acid compound co-formulated with an acid for direct application. As detailed above, Applicant maintains that the claims, as amended, are not rendered obvious by the combination of Fritz *et al.* (U.S. Pat. No. 3,879,188), the CABA abstract and The Agrochemicals Handbook. Applicant further maintains that the HCAPLUS reference, which also does not teach or suggest co-formulations does not cure this defect. With respect to new claims 12-15 Applicant reiterates that the HCAPLUS reference does not teach or suggest ethephon/phosphoric acid compositions. As such, Applicant maintains that the references cited by the Examiner either taken alone or in combination do not

render the composition and method of the instant invention obvious. Applicant therefore respectfully requests that the Examiner reconsider this rejection.

Applicant believes that the pending claims are in condition for allowance. If it would be helpful to obtain favorable consideration of this case, the Examiner is encouraged to call and discuss this case with the undersigned.

This constitutes a request for any needed extension of time and an authorization to charge all fees therefore to deposit account No. 19-5117, if not otherwise specifically requested. The undersigned hereby authorizes the charge of any fees created by the filing of this document or any deficiency of fees submitted herewith to be charged to deposit account No. 19-5117.

Respectfully submitted,

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